PERSONNEL
Journal

Published by

Personnel Research Federation

Volume 15 *Number 9*

Contents for March, 1937

ARTICLES

Salaries of Executives.....*E. L. Thorndike and B. P. Beckwith* 312

Inside Facts on General Motors Strike
Department of Research and Education 321

Efficiency Ratings.....*Robert L. Hill* 330

Good Working Conditions for Eyes.....*C. E. Feree and G. Rand* 333

Temperament Tests as Personal Aids.....*Guy W. Wadsworth, Jr.* 341

BOOKS

Leadership in a Free Country.....*T. N. Whitehead* 347

Administrative Labor Legislation.....*John B. Andrews* 349

The Anatomy of Personality.....*H. W. Haggard and C. C. Fry* 350

PERSONNEL JOURNAL. Published monthly (except July and August) from January to December. Publication office, Mt. Royal and Guilford Aves., Baltimore, Maryland. Editorial and General Office, Engineering Societies Building, 29 WEST THIRTY-NINTH STREET, NEW YORK, N. Y. 75¢ a copy. $5.00 a year in the United States and countries within the postal union; $5.50, countries outside the postal union. Entered as second-class matter at the Post Office at Baltimore, Md., under the Act of Congress, March 3, 1879. Copyright by the Personnel Research Federation, New York, N. Y.

Subscribers are requested to send notices of change of address three weeks before they are to take effect. Failure to send such notices will result in incorrect forwarding of the next copy and delay in its receipt

Copyright, 1937, by The Personnel Research Federation

Motion Picture Companies Pay the Highest Salaries to their Top Executives, Chemical and Drug Companies are Next Highest, then Come Manufacturing Industries and Trade, with Public Utility Salaries Well Down at the Bottom of the List.

Salaries *of* Executives

By Edward L. Thorndike and Burnham P. Beckwith
Institute of Educational Research
Teachers College, Columbia University

We have examined the S. E. C. reports of salaries paid in past years to the chief officers of over 400 corporations, mostly registered on the New York Stock Exchange, in relation to various features of these corporations.

This analysis revealed the great variability of salaries that exists among even the most similar companies in size and character of work. Certain other facts are also clear and emphatic. (1) Public utility salaries are very low. Top salaries and second salaries are only about three-fifths those of the general run of companies of equal magnitude as measured by a formula (exclusive of railroads and public utilities). (2) Moving picture salaries are very high. The salaries of our three moving-picture companies are about three times those of other companies of equal magnitude. (3) It also appears that chemical and drug industries pay about one-fifth more than the general run of businesses (exclusive of railroads and public utilities). On figure I we show individual salaries in these industries plotted along with the lines showing the medians for the general run, and also three salaries of moving-picture companies.

In this article we present the facts upon which these conclusions are based, discussing in particular (1) the variability of salaries among

companies of approximately the same size as measured by total assets, gross revenue, and number of employees, (2) the relation of the salary of the president and of the two next highest paid officers to the size of the company among companies doing roughly the same sort of business, and (3) the relation of these salaries gross revenue or any other single factor is inadequate.

The management of a business by an executive requires him to manage property, to manage production and sales, and to manage personnel in relation to these. Taking these three factors into consideration, we have experimented with different formulae,

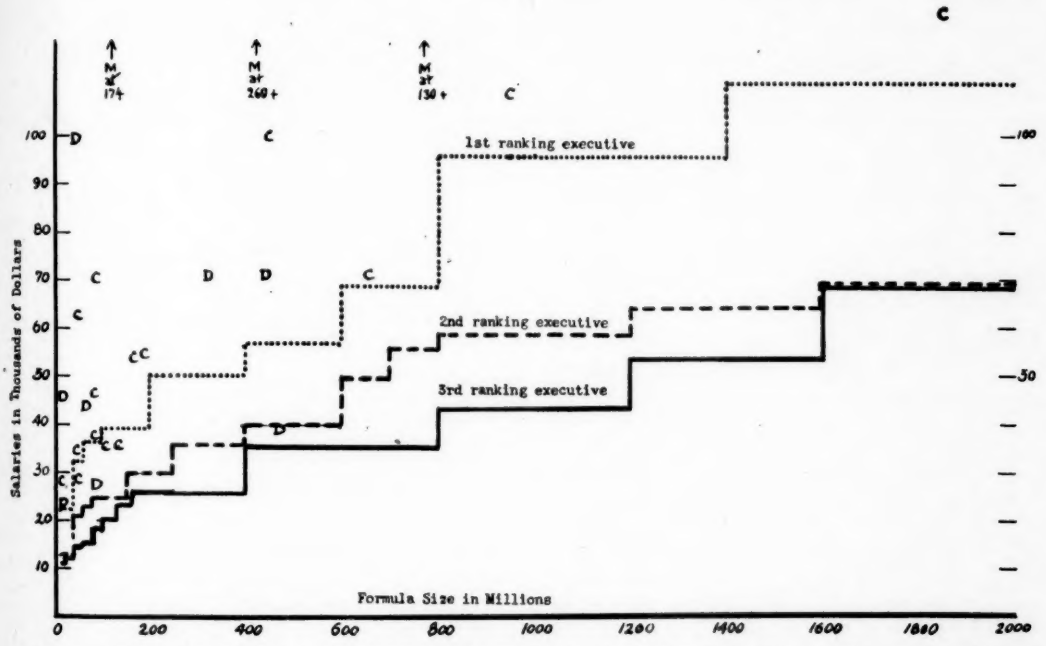

FIG. 1. Median Salaries of 1st, 2nd and 3rd Ranking Executives, in relation to formula size of company. All companies except railroads and public utilities. C's, D's and M's are individual salaries of highest paid officers of chemical, drug and motion picture companies.

to differences in the nature of the business. We shall use here the data for 1935.

Size of Company

In measuring the size of a company from the point of view of the responsibilities of its managing officers, it has seemed to us that total assets or and have finally developed the following one as being a reasonable measure of the size of a company in its relation to executive responsibilities:

Size of Company = Total Assets in dollars
+ Twice Gross Revenue in dollars
+ 20,000 times Number of Employees

or briefly

Formula Size = TA + 2GR + 20,000E

For example we may show the use of this formula for companies of two different sizes,

General Motors (1935)

Total Assets	1,414,000,000
Gross Receipts	1,155,000,000
Number of Employees	211,000

Applying the formula we have:

TA =	1,414,000,000
2GR =	2,310,000,000
20000E =	4,220,000,000
Formula Size =	7,944,000,000

W. T. Grant Co. (approx.)

Total Assets	35,000,000
Gross Sales	100,000,000
Number of Employees	15,000

Applying the formula we have:

TA =	35,000,000
2GR =	200,000,000
20000E =	30,000,000
Formula Size =	265,000,000

On contrasting the formula sizes of these companies, we see in General Motors that the Employees factor contributes over 50% of the total weighting. In view of recent events in the General Motors situation we can well see the importance of this factor as an executive responsibility.

On the other hand, with the W. T. Grant Co., we see a company operating on a very large quick turnover at a very small profit, so that the maintenance of a high gross revenue is the most important job of this company's executives.

These two cases illustrate how our formula may be applied to widely different forms of business.

Use of Formula

We admit that all such formulae are arbitrary, since we do not know the equations for the abilities required to manage property, manage production and sales, and manage personnel in terms one of another, and that at best they can be only coarse approximations. We further see that the equations, if they could be known, might be very different in different sorts of business. Consider, for example, the management of equal dollar-assets of a holding company, a copper mine, a water power, a railroad, and a factory.

But for our purposes any reasonable combination is useful. It certainly is better than using total assets, or gross receipts, or number of employees alone, when we learn what the general relation of salaries among companies doing the same sort of business is to each of these factors. Whether any other single system of combining these three figures would give better weights than we have used is unknown, and is hard to ascertain.

That formula will be the best which (a) produces the highest correlations between the total size of companies measured by formula in different years, (b) makes the variations in the salaries of corresponding officers in companies of equal total sizes a minimum, and (c) makes the curves of corresponding salaries in relations to total sizes smoothest. We have also

TABLE I

Variations in Size of Salary of Executives of Manufacturing Companies

Average salary in $1000	Gross Revenue in Millions of Dollars		Formula Size in Millions			
	8–10	20–25	40–60	60–80	40–60	60–80
	(a)	(b)	(c)	(d)	(e)	(f)
4–5					1	
6–7						
8–9						
10–11					2	1
12–13			1		2	
14–15		1	1	1	2	3
16–17			1			1
18–19					3	
20–21	1		2		1	1
22–23				1	1	2
24–25	3		1		1	2
26–27	2			1		1
28–29			2			
30–31	2	1		2		1
32–33		1	1	1		1
34–35			3	1	2	
36–37	2	2		1		
38–39						
40–41	1		2			
42–43	1				1	
44–45	2			3		
46–47				1		
48–49		1			1	
50–51	2		1			
52–53	1	1	1		1	
54–55		1				
56–57	2		1			
58–59				1		
60–61		1				
62–63	1		1			
64–65		1				
66–67	1					
68–69						
70 and 90		1				
	1					
100			1			
101		1				
111		1				

tried other formulae such as TA + 2GR + 10,000E, but not exhaustively.

Coming now to the general application of our formula we see in Table I the salaries of the presidents of manufacturing companies (a) having gross revenues of 8 to 10 millions, and (b) having gross revenues of 20 to 25 millions. It also shows the highest salary in manufacturing companies whose formula sizes were (c) from 40,000,000 to 60,000,000 and (d) from 60,000,000 to 80,000,000; and also in columns (e) and (f), the next to the highest salary in these same companies.

We see plainly in this table the great variation in salaries of executives. For example in the first column we see in companies of gross revenue between 8 and 10 million dollars that some highest paid officers receive as low as $20,000 in salary while others receive as high as $90,000. And so on throughout the whole table.

Our data do not furnish many companies of closely the same magnitude, but by calculation and interpolation we can infer from them what the variations would be in a hundred companies having gross revenues of exactly one million dollars, in a hundred having gross revenues of exactly two million dollars, or in a hundred companies having formula sizes of 5,000,000, 6,000,000, 7,000,000, etc.

Salaries and Services Rendered

Among a hundred companies of the same magnitude, the variation in the amount of the first, second or third salary will be so great that some company will pay about twice

as much as the median company of that size, and about four times as much as the company paying least. The range between the 75 percentile company and the 25 percentile company will be about three-fifths of the total salary paid by the median company.

These ratios will be higher for the companies with Gross Revenue under $20,000,000 and with a formula size under 150,000,000, and lower for the larger companies. The amount of variation among the giant companies like U. S. Steel and General Motors cannot be safely inferred. Table II presents an abbreviated summary of the data regarding the pay of the highest paid company officers upon which our inferences are based.

TABLE II

Pay of Highest Paid Executive in Relation to Company Size

Salary range in $1000	Formula Size of Companies (in millions)						
	Less than 40	40–80	80–160	160–300	300–600	600–1000	Over 1000
0–9	2						
10–19	21	4	5	2			
20–29	14	11	13	3		1	
30–39	9	12	13	5	1		1
40–49	5	6	6	5	5		
50–59		6	5	3	5	1	1
60–69		2	3	3	4	2	2
70–79		1	3	2	3	2	1
80–89			1	1			
90–99			3			1	4
100 and over		1	4	2	3	2	7

The variations in the salaries of management at these levels cannot easily be explained as the result of close bargaining of companies for ability and of men for financial rewards, nor safely be taken as accurate measures of the services rendered. Custom, inertia, and a certain amount of indifference to pecuniary rewards seem to play important rôles.

Salaries per Million Dollars, G. R.

If one plots the salaries of corresponding officers in companies roughly alike in the nature of their business (such as telephone companies, or companies furnishing electric light and power, or railroads, or chain stores) against total assets or gross revenue or number of employees, the relation between size of company and pay of officers shows great variation. However all groups are similar in showing rapidly diminishing increases in salary with equal additions to assets, receipts, etc.

The median payment to the president per million dollars of gross revenue for manufacturing companies, for example, drops from about $7000 per million in companies receiving 2 to 4 million annually, to about $2000 per million in companies receiving 25 to 30 million annually, and to less than $1000 per million in companies receiving 100 to 150 million annually. The median payment to the next most highly paid officer in the same sets of companies drops from about $4000 per million dollars of gross revenue in the smallest companies to about $1000 per million dollars revenue in median sized companies and to about $500 per million dollars revenue in the largest companies.

Table III presents the facts concern-

ing the relation of size of company and median salary of the most highly paid officer for various groups.

salary to size of company between mining, oil, chain stores, department stores, restaurants, and miscellaneous

TABLE III

The Relation of Top Salary to Size of Company

Median Salaries of Most Highly Paid Officer

Formula Size in Millions	Non-Manufacturing				Manufacturing							Semi Public	
	Oil and Mining	Chain Stores	Dept. Stores	Misc.	Autos and Airplanes	Chemicals	Foods Drinks Tobacco	Light Mfg.	Machinery	Metals	Misc.	Rails and Transit	Public Utilities
10–19	23			30		28	30	14	26	15			20
20–29	18	25		39	16		29	28	28	14	18		8
40–59	29	36	42	23	34	35	33	29	25	32	35	52	24
60–79	50	68	144	56	30		14	35	45	33	46	21	15
80–99	35	20	26	38		48	15	34	27	30	90	18	20
100–129	54	33	75	16	25	28	66	50	24	157	18	25	36
130–159					73	78	90	36	39	53	56	40	22
160–199		40		30		55		62	31	60			21
200–249	69	39	29			50	66	19	64	32		30	40
250–299		23		40			76	42	42		62	66	42
300–399	53	37			91				65			18	32
400–499	46	60				100				60			45
500–599	55	50								69			61
600–699		23				72				50		27	41
700–799		110	65						76				46
800–899	100												44
900–999		94				109					60	60	
1000–1099		58										36	66
1100–1119							95		91			49	
1200–1299	139											50	
1300–1399		100								141		60	
1400–1499										94		49	
1500–1599	168												
1600–1699													
1700–1799									54				
1800–1899						126							
1900–1999									96			60	52
2000–2499										203		60	
2500–2999							68						
3000–3999							60						
4000–4999												60	
5000–5999													
6000–7999	125				375								

Using our formula as a measure of the size of a company, we find (as shown in this table) no demonstrable differences in the ratios of size of

business, nor between the different sorts of manufacturing (of airplanes, automobiles, metals, machinery, foods, drugs, tobacco products, etc.).

For this reason we have combined the data from all these. In other words, we have included all the data except those for railroads, public utilities, and moving-picture companies.

Figure 1 shows the median salary of (a) the most highly paid officer, (b) the next to the most highly paid, and (c) the third salary in relation to formula size for all companies except railroads and utilities. As salaries in chemical companies and drug companies are higher than for manufacturing generally we also show as c's and d's the top salaries in individual chemical and drug companies (salaries in Figs. 1, 2 and 3 are grouped to favor smoothness of the curves).

It is obvious that no simple mathematical equation can describe the relation between salary and company size. $y = 85\sqrt[3]{x}$ would fit the beginning of the curve for highest salaries fairly well and the middle of the plateau for companies of 1000 million to 2000 million, and would not be impossible for the three companies with ratings from 2000 to 2500 and with top salaries of $60,000, $68,000 and $203,000, or for the three great companies with ratings from 6499 to 7959 and with top salaries of $125,000, $167,000, and $375,000. But it would leave a great dip from about 100,000,000 to about 600,000,000 and a too sudden rise thereafter. $y = Cx^{\frac{1}{2.75}}$ might make a better fit, but it also would not be very good. (The line above 1600 to 2000 is a part of a line for 1600–2500.)

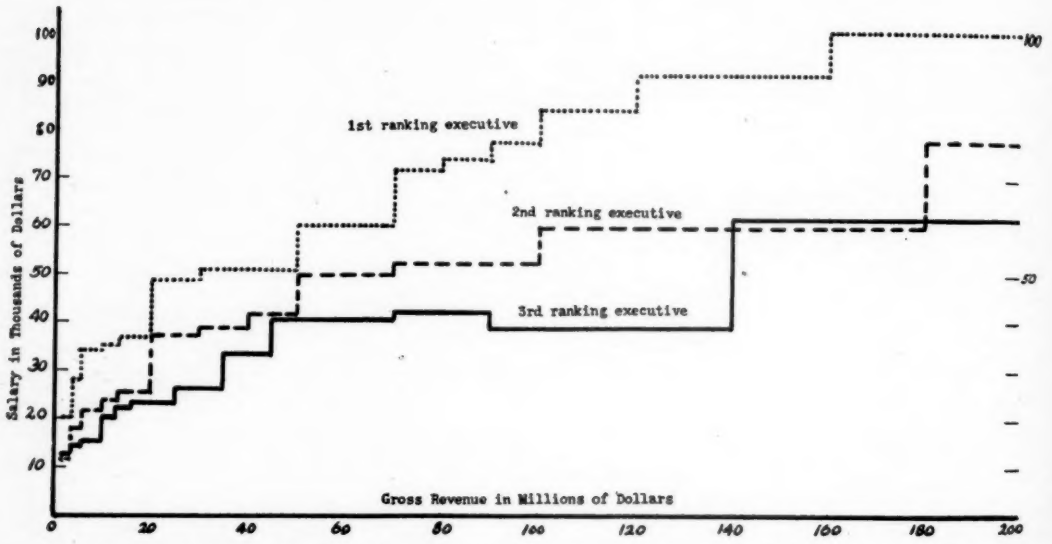

FIG. 2. Median Salaries of 1st, 2nd and 3rd Ranking Executives in relation to Gross Revenue of company. Types of business included; oil, mining, chain stores, department stores, and automobile, airplane, chemical, food, drink, tobacco, machinery, metal and other miscellaneous manufacturing. (See Table III)

The relation for second salaries is more regular than for first, and $y = 58\sqrt[3]{x}$ is not a bad fit considering the scantiness of the data.

The six largest companies, not included in the diagram, had records as follows:

Formula size (in millions)	*Salary in $1000*
2092	180
2269	54
2458	50
6499	113
7236	125
7949	375

Figure 2 shows similar facts for manufacturing companies only and in relation to gross revenue instead of formula size.

Figure 3 shows the relation of median salary of the highest paid officers to formula size in the case of Public-Utility companies. There can be no doubt from an examination of that Figure that the "negative acceleration" or diminution of salary per unit of size of the company is greater in the public utility companies than in ordinary business concerns. If we leave out of account a salary of $210,000 for a company of twelve thousand million, the salary rises about as the fourth root of TA + 2GR + 20,000E.

Nature of the Business

Among companies alike in magnitude one would expect that those, the successful management of which was most difficult in the sense that it required rare combinations of high degrees of valuable abilities, would be best paid. Such would, other things being equal, be enterprises in new fields presenting novel problems, enterprises subject to caprice and fashion, enterprises beset with difficulties in both production and selling,

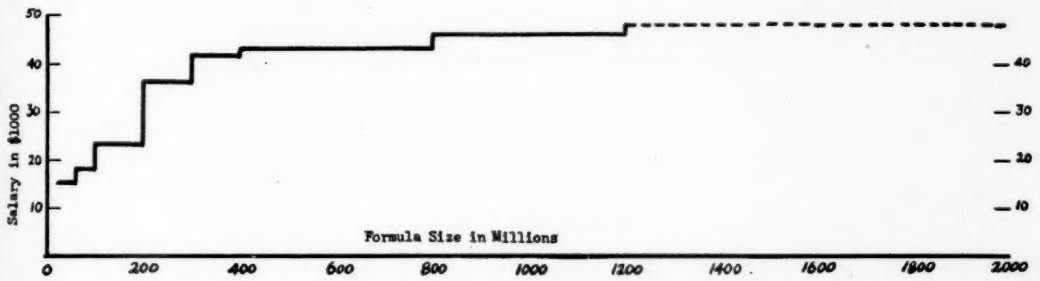

FIG. 3. Median Salaries of most highly paid public utility executives in relation to formula size of company.

and enterprises in which the employees required more than pecuniary inducements to work well, or in which harmonious cooperation of employees was especially important.

So far as they go, the facts we have presented are in harmony with the hypothesis that the wages of management will increase with the difficulty of the task, other things being equal. But the extent and importance of its application are left in doubt.

Among industries of the same size and beset by equal difficulties, certain features of prestige do, or once did,

make banking, wholesale trade, and publishing more estimable than say oil companies, department stores and the manufacture of clothing. Absence of this prestige would probably act to raise the salaries of the latter, but our data do not reveal anything notable in this respect. They point in general toward the weakening and disappearance of such prestige values in the case of the top management of large companies.

The relation of salaries to profits per unit of size, and to profits per unit of money invested in the business is of obvious importance. Our studies of it will be reported later.

Executives of Non-Profit Concerns

Interesting comparisons might be made between the form of these curves and the forms of the salary curve of (a) army and navy officers in relation to the magnitude of their commands, (b) college presidents in relation to the size of the material plant, teaching staff, and student body, and (c) mayors, superintendents of schools, city engineers, and other municipal officers in relation to the size of the city or other administrative unit.

But this may well wait until more reliable determinations can be made of all the curves in question. At present we do know that the army and navy curves rise even more slowly than the curve for officers in public utility companies. Also our evidence suggests that the curve for the income of the genuine entrepreneur of classical economics, who risks his own funds and is responsible only to himself, rises very rapidly with the magnitude of his operations, perhaps even as some power of the magnitude.

If you Enjoy a Good Laugh Read about Membership in the Flint Alliance and How a Letter was Sent to President Roosevelt.

Inside Facts *on* General Motors Strike

By Department of Research and Education
Federal Council of the Churches of Christ in America

In 1921 and 1926 the American Federation of Labor and the craft unions composing it made unsuccessful attempts to organize the automobile workers. Another effort was made under the NRA in 1933–1935. Dissension arose over jurisdictional claims and several unions came into existence. Demands arose for an industrial union which would include all classes of workers. Following the struggle over the question of industrial unionism in the A. F. of L. convention of 1934 and 1935 the United Automobile Workers Union (U.A.W.A.) was established and given limited jurisdiction. The union demanded complete jurisdiction and when the Committee for Industrial Organization (C.I.O.) was formed late in 1935 for the purpose of organizing the mass production industries the U.A.W.A. joined it. Since then it has been conducting a vigorous organizing campaign.

The General Motors strike began with sit-down strikes in Flint in December, 1936. The sit-down strike technique had been previously developed by spontaneous action of employes in other industries. On January 9, 1937, Homer Martin, the president of the union, said "We have never given anybody orders to sit down."

Charges and Counter Charges

The General Motors Corporation declares that the strike was begun without attempts to adjust differences by collective bargaining. The union on December 21, 1936, asked for a conference with the principal officials of the company but was informed by William S. Knudsen, executive vice-president, that it should take up grievances with plant man-

agers. He said on December 31 that grievances could only be handled locally where the managers and employes were familiar with local conditions and "with the basic policies of the corporation concerning employe relations." He said further that the corporation "accepts the principle of collective bargaining and desires to maintain satisfactory relations with all its employes regardless of union or non-union affiliations," adding that the corporation had established a procedure for it on August 15, 1934.

The union, on the other hand, charged that the attitudes and action of the plant managers had made local bargaining ineffective, that hundreds of men had been victimized for union activities, that the company had made extensive use of spies to enable it to practice systematic discrimination against union men, and that men discharged for union activity were blacklisted so that they could not get a job in any other plant. Furthermore, the union insisted that since the corporation's labor policies were made by the higher officials, not by plant managers, they should have a conference with the former to negotiate a corporation-wide agreement.

Union Not to Run Plants

On January 4, 1937, Alfred P. Sloan, Jr., president of the corporation, in a statement to the employes and in a newspaper advertisement declared that the union was asking for a closed shop which would make it necessary for the workers to "pay tribute to a private group of labor dictators for the privilege of working." He insisted, furthermore, that "the real issue is perfectly clear . . . Will a labor organization run the plants . . . or will the management continue to do so?"

Mr. Martin replied that the union was not asking for a closed shop nor seeking to "run" the plants, but for a conference with the highest officials to discuss the following subjects: the abolition of piece work; the 30-hour week; time and one-half for overtime; a minimum rate of pay; reinstatement of unjustly discharged workers; seniority based on length of service; the speed-up; the recognition of the union as the sole bargaining agency; and joint tribunals for the adjustment of disputes.

By this time sit-down strikes had spread so that they were seriously crippling the company's production. The strike in the glass industry was causing a serious shortage in glass. As a result the company found it necessary to curtail operations and to cancel orders for materials from the many industries serving it. Thus many of the company's 211,000 employes in 35 communities and 14 states were thrown out of work although they were not involved in the strike. An injunction was obtained ordering the strikers to evacuate the plants.

On January 6 the corporation indicated that it would not insist on local bargaining, that it was willing to confer on broad policies but that it would not recognize the union as the

sole bargaining agency nor bargain until the plants were evacuated by the strikers.

Abortive Truce

As the result of the mediation of Governor Murphy of Michigan, where the situation was most critical, a truce was arranged and an agreement arrived at to enter into negotiations on January 18, the plants to be evacuated first. The company promised that it would not remove dies or other equipment from the plants (a provision which the union had insisted on as a safeguard to its bargaining power) nor resume operation of them for a period of 15 days during negotiations. The union promised to evacuate the plants by January 18.

While the evacuation was going on, the workers in three plants having left, Mr. Martin declared that he had received information that a secret agreement had been made by Mr. Knudsen to meet representatives of the Flint Alliance, an organization composed of "loyal workers," business men and other citizens, on January 19. The union regarded this as a breach of faith and an attempt to play one organization against the other and stopped the evacuations. Mr. Knudsen maintained that the corporation all along had insisted that it would bargain with any group of its employes and denied that a meeting with the Alliance had been arranged for any date during the negotiations with the union. The union representatives met the company representatives on January 18 and the company refused to negotiate unless the rest of the plants were evacuated.

Efforts were made without success by Governor Murphy and Frances Perkins, Secretary of Labor, on January 20 to induce the company and the union to agree on a basis of negotiations. Secretary Perkins, using her power to mediate conferred by a law in 1913, invited both parties on January 25 "to attend without condition or prejudice a conference . . . to consider renewal of negotiations." Mr. Sloan declined this invitation to meet with representatives of the union on the ground that the union on January 20 had refused to evacuate the plants unless the company accepted the union as the sole bargaining agency.

The Flint Alliance

Since the negotiations above referred to failed because of the relations of General Motors officials with the new organization known as The Flint Alliance, the origin and nature of that organization are extremely pertinent. Mr. G. E. Boysen, its president, stated in press interviews that the members of the Alliance, which he represents as constituting a majority of General Motors employes in Flint, do not pay dues, but that the organization is financed by the business men of Flint and that its membership is made up of business and professional men and citizens as well as General Motors employes.

A large number of interviews with both non-union and union men in

Flint showed that Alliance membership application cards (business reply cards, postage paid) were distributed in General Motors plants, in some cases to the men as they worked. The inevitable inference was that the corporation had authorized this since it occurred during working hours. In other shops, workers stated, the cards were passed out at the gates by company police. In still other shops the cards were passed out at the doors (inside the gates), on company property. Direct evidence shows that in one case, at least, the men who distributed these cards were given "15 minutes time"—in other words, paid by the corporation for handing them out.

The cards read as follows:

> "Membership Card
> The Flint Alliance
> for the
> Security of Our Jobs, Our Homes, and Our Community
>
> Name .....
> Address .....
> Where employed .....
>
> Please Fill Out and Mail—Postage is Prepaid."

In the light of these facts the union officials put the obvious interpretation on the exchange of telegrams between Mr. Boysen and Vice President Knudsen of General Motors, which was widely reported in the press. On Friday, January 15, Mr. Boysen (who, it appears, was formerly a General Motors paymaster) sent a wire to the corporation protesting against continued suspension of work for the purpose of negotiations in which the "majority of the employes in General Motors plants will not be represented." He urged that all employes be put to work "regardless of affiliation with any labor organization," and called upon the corporation, on behalf of "this great majority of workers" for assurance "that their position will not be overlooked in your dealings with the representatives of this small group."

Mr. Knudsen replied by telegram, promising "to get all men back to work as soon as possible," explaining that delay was due to the "desire to avoid violence," and concluding:

"You may assure your people that General Motors will look after the interests of Flint now as it always has and that no man's right to be represented by whomsoever he chooses will be denied. General Motors will never tolerate domination of its employes by a small minority."

Men Suspect Bad Faith

Mr. Boysen sent another telegram, quoted in the press on January 18, asking officials to confer on January 19 with a committee of the Alliance "on collective bargaining as it affects the great majority of your employes." Mr. Knudsen replied, stating that the corporation was "ready always to discuss with your group, or any group of our employes, any questions without prejudice to any one." He added, "we shall notify you as soon as possible as to time and place for a meeting."

This attitude coupled with evi-

dence that the corporation had co-operated with the Alliance in building up its membership among the employes, gave the officers of the union their ground for suspecting "bad faith." The union had already begun on Sunday to carry out the terms of the truce, sit-down strikers having evacuated the Cadillac and Fleetwood plants in Detroit and the Guide Lamp Plant at Anderson, Ind. The men apparently became alarmed lest their own negotiations with the corporation might be carried on as a matter of form while preparations were made to enter into agreement with the Flint Alliance.

Circulation of Petitions

The corporation in support of the contention that its employes are overwhelmingly satisfied "with present bargaining methods," points particularly to petitions of the employes signed by 29,908 out of 37,800 employes in Flint plants. It is important to note the method by which signatures to these widespread petitions appear to have been obtained. From a large number of personal interviews with non-union as well as union workers in a number of General Motors plants in Flint the following samples will suffice. (Names and plants are omitted.)

....., employed over eight years by General Motors, said petitions, mimeographed sheets with place for signatures, were taken "from man to man by the Works Council representative followed by Foreman ..... I saw the foreman call three men who refused to sign over to his desk several times until they finally signed."

....., employed over nine years, said that in ..... plant, "the petitions were passed around by Works Council representative who told us to 'read it and sign it.' I replied, 'Well; if I have to sign it anyway, there's no use reading it.' "

....., employed in plant ..... several years, said "I didn't want to sign the petition they passed around but what could I do? I'm past 40 and didn't want to lose my job, so I signed."

....., employed over six years, said that on pay-day, two representatives of the Personnel Department stook looking on and petitions were handed to each one to sign. "I refused—the man said, 'Don't you want to work.'—I said 'I want to work and I don't want to lose my job.' He said 'then why don't you sign it.' . . . My opinion is that nobody would have signed it unless they'd had company men in authority around."

....., employed for a shorter period, refused to sign but man came back and said "You're going to sign it or I'll report you to Foreman ....." This man finally signed because he was "a young man with children, buying his home." He is now afraid to join the union.

....., employed over ten years, said "the straw-boss's right-hand man passed the petitions. I refused to sign but the second man from me—he's got a family and home and he felt he'd better sign it."

....., employed over 15 years, said "the shop rules forbid passing any petitions so in our department we were told to go up in the toilet and sign. We all felt we had better sign since we thought it was a method to spot union sympathizers. In other departments the petitions were passed openly."

....., employed at plant ....., said that petitions were passed around, also a

printed letter addressed to President Roosevelt. "The foreman who came around with it said 'You want to work, don't you? Then sign this. All you've got to do is sign it—it will be mailed and everything for you.' "

A copy of this letter was obtained by the investigator. It reads as follows:

"*Hon. Franklin D. Roosevelt,*
President of the United States
Washington, D. C.
Dear Sir:

In regard to the present General Motors strike.

This strike is being conducted by a minority. It is unjust to the men of the majority who wish to continue their work.

We respectfully ask that you consider the majority and their families and do all in your power to restore normal conditions at the earliest possible moment.

Yours truly,

.....

This letter was introduced and printing costs paid for by the employes of General Motors plants who desire not to be represented by the C. I. O. people.
Postage paid by sender of this letter."

This record of evidence is too eloquent for comment.

Discrimination Against Union Men

Specific testimony was given by employes having years of service to their credit that the management practiced continual discrimination against union men.

....., employed by General Motors since 1930, "was laid off from August until November last year and was told by Mr. ..... of the Personnel Office that it was because of my union activities. He said I had a good record otherwise."

....., employed several years, said on a recent occasion he was laid off with 15 or 20 others, "all union men. The non-union men were kept. The fellow I worked with was not a union man. He was kept all week but I was laid off." Q. "What makes you think they knew you were a union man?" A. "Just before I was laid off my foreman came around and asked my straw-boss, 'How many union men do you have in here?' The straw-boss replied, 'I don't know. There's a lot of them around here.' The foreman replied, 'I'll bet I could spit on one right from here.' They were standing right behind me."

....., employed over six years, also testified that the company was "against unions." "You never know who you're talking to and don't dare say what you really think."

....., on day shift in plant .....: "Most of the men are afraid to even talk about a union. I did, at lunch hour. For myself I don't care. My children are now grown up and I can take a chance if I can do something to help the younger workers. But you never know who you're talking to."

Another said, "One way they get rid of a union man is to transfer him to another department. Then the new foreman fires him as inefficient."

Another older employe (non-union) said, "It's always been understood all through the plant that it's as much as your job is worth to even talk union."

Illegal Acts of Corporation

Recent disclosures before a U. S. Senate committee investigating violations of civil liberties showed that the corporation had engaged actively

in espionage through paid outside operatives. The National Labor Relations Board on January 28 petitioned the Circuit Court of Appeals for the Eighth Circuit to vacate a stay issued last July at the instance of the General Motors Corporation preventing the board from holding a hearing on a complaint by Local 25, United Automobile Workers of America, referring to the St. Louis Chevrolet-Fisher Body Assembly Plant. The petition states: "The industrial disputes which the National Labor Relations Board sought to prevent and of which it warned in its June complaint have now occurred. Thousands of employes of these appellants are engaged in a strike.

"Evidence is in the possession of agents of the National Labor Relations Board that the General Motors Corporation and those of its subsidiaries which are appellants herein have for a considerable period engaged in aggravated forms of industrial espionage, threats and coercion, violated the rights of their employes by unlawful searches of their possessions, and unlawfully sought to prevent their employes from joining labor organizations of their own choosing."

Causes of Discontent

Furthermore, many non-union as well as union men, most of whom had signed the petitions under the circumstances described, expressed dissatisfaction with conditions, particularly the speed and high pressure under which they were obliged to work. A few illustrations may be given here:

....., employed several years. Q. "What is the situation on speed of work?" A. "It's more than you can do. Everybody is dissatisfied." He said one plant was known as "the slaughter house" because of high speed and many accidents.

....., employed over 12 years, said the foremen always reply to complaints on speed "if you can't keep up, we'll get a man that will."

....., employed over 15 years. Q. "What is the quota on your job?" A. "We are expected to do about 3,600 a day (9 hours), making an average of about 400 an hour." Q. "Does that mean that on an average you have about 10 seconds for the inspection of each part?" A. "Yes. Sometimes less than that when the speed is higher." Q. "Just what do you have to do?" A. "I have to pick up the part, turn it over on all sides and look at four or five different places to see whether they are all right and then measure a space with an instrument. If the measurement is not right I have to chalk the part and put it aside and do all this quickly enough to catch the next one from the man ahead of me who keeps right on passing them to me." Q. "How do the workers generally feel about the speed?" A. "Everybody is dissatisfied except a few young fellows who never worked anywhere else and have got the strength to stand it for a few years."

....., long service, said, "For the past two years we have been speeded up more all the time. I can hardly stand it. Nine hours a day with no rest periods."

....., employed several years, said the speed-up was so extreme that "two men on the line last week got so nervous they broke down and cried and had to be sent home."

....., employed over ten years, was reluctant to talk (as were many others). He

said, "If it gets back to them, I'll get fired. . . . It's a terrible nervous strain. I've got to keep up." On one job he makes 115 double motions per minute with his hands (nearly 2 a second). The operation requires close concentration of vision. He works nine hours a day, with no rest period except for lunch.

Many stated that after the general pay increase granted by General Motors November 9, 1936, another speed-up was instituted, giving specific quotas in support of their statements.

Conservative citizens of Flint who were vehemently opposed to the strike said frankly that the speed in some of the plants was an unreasonable strain on the workers, and constituted a real cause of wide dissatisfaction and "ought to be remedied."

Does the Union Represent a Majority?

The question whether the U.A.W.A. actually represents a majority of the workers in General Motors plants is one of the main questions in dispute. It is not one that can be answered satisfactorily by a simple "yes," or "no." From the union's point of view the attitude of workers in a concern which has been so sharply hostile to unionization can not be measured by actual union membership. Obviously, only employes of extraordinary courage could be expected to join a union under constant fear of losing their jobs. It is difficult for outsiders to sense what it means to a man to risk the loss of his job, in order to join a union. Various estimates are given of the number of "sit-downers" at Flint and in various Detroit plants from 200 to 1,500. The number actually left for any time in a plant, however, is not necessarily indicative of the number of strikers. It has been a considerable task to supply food to the men inside the plants and it planned to leave in some cases only enough to close down the line—also only selected employes "who could take it."

It was reported that a considerable number of union automobile workers from other cities came to Flint to swell the picket lines.

Why Wagner Board Not Called In

The question inevitably arises why the National Labor Relations Law has not been invoked in order to determine the strength of the union. It provides for the holding of impartial elections of representatives for collective bargaining in just such situations as this. Neither side has been eager to invoke the law; the union because, in the existing circumstances it was not sure of its own strength in certain plants (although claiming a majority of the total body of workers); and the corporation because it is not in accord with the principle of majority representation which is written into the law. Indeed, the corporation, as already stated, obtained an injunction restraining the National Labor Relations Board from functioning at St. Louis.

The union maintains that since General Motors is a national unit, any "collective bargaining," to be

equitable, should be with a national labor body. The term "sole bargaining agency" means only that the principle of majority representation shall apply to industrial relations as in a political democracy. The union does not demand the closed shop.

Non-Striking Employes

In Detroit a "Workman's Committee has been formed, which, its chairman told the Federal Council investigator, "represents all of us at Chevrolet Gear and Axle Division—nearly 10,000 men." He said, they held a large mass meeting (on company property) and demanded the reopening of the plant. He said they were trying hard to restrain their members from going up to Flint in force and ejecting the sit-downers. Other mass meetings were reported in other cities and on January 26, a Flint Alliance mass meeting was held which the *I. M. A. News* (plant paper) and press dispatches reported was attended by 9,000 employes. It denounced the union and demanded immediate reopening of the plants. The *I. M. A. News* which states that Flint workers are "most of them completely happy with their jobs" reports the receipt of large numbers of letters from employes expressing "loyalty to the company" and desire to return to work.

Ethics of Sit-In Strikes

The sit-in strike is a new technique in that it involves maintaining possession of the company's property and holding it against all efforts of the legal owners to possess and operate their plants. It has been contended that the legality of this procedure has yet to be finally determined. However that may be, that it is contrary to all our accepted principles of law and equity would seem to be too plain for argument. The significance of what has happened in Flint and Detroit is this: that when the right of labor to organize and bargain through representatives of its own choosing—a right declared in law and supported by national policy—is denied by owners and managers of industry, labor is likely to adopt extreme measures to obtain that right. Until equity is established illegal procedures almost inevitably result. The sit-in strike is manifestly a dangerous weapon. It can be employed in a wholly tyrannical way by a minority of workers who happen to be in position to tie up a huge concern by taking possession of key plants. In the light of principles repeatedly declared by church bodies and by innumerable civic agencies, the immediate necessity would seem to be a determination by impartial procedure, free from all coercion by the company or the union of what agency the employes of General Motors actually want to represent them.

(Editor's Note. We are obliged to the Editor, Information Service, Federal Council of the Churches of Christ in America for permission to use this material.)

If a Supervisor Rates Nearly Everyone in His Division as Excellent or Very Good Don't Lecture him on Statistics. He May be Right.

Efficiency Ratings

By Robert L. Hill
Home Owners' Loan Corporation
Washington, D. C.

Personnel workers concerned with obtaining "efficiency," "service", or "performance" ratings are often dissatisfied because the supervisor or other rater, tends to rate almost every employee as "excellent" or "good."

These personnel men usually take it for granted that in rating any group of employees engaged in the same type of work the ratings should be spread widely from poor to excellent, with a majority near the average. In statistical language, they believe that ratings should assume a "normal" distribution.

Any distribution which departs notably from the familiar bell-shape of the normal curve is viewed with suspicion and efforts are made to uncover the cause of the anomaly. If a supervisor fails to maintain the proper average and "spread" in rating his subordinates, he is apt to be lectured by the personnel officer on the theory of individual differences and the normal curve. It is assumed that any supervisor who rates the performance of nearly all of his employees as "excellent" or "very good" is either unobservant or unwilling to make distinctions that are certain to exist.

Books and articles, in discussing rating scales, usually admonish the person responsible for the rating program that: "The person doing the scoring should be instructed carefully in the usual distribution on the scale" (Hull); or ". . . information will have to be given them about the statistics of distribution of abilities and the quantitative relationship of differences in abilities" (Bingham and Freyd). Formerly, in the Federal Civil Service, when the rating

program was administered by the Bureau of Efficiency, the circular of instructions recommended that a specified average of 82.5 be maintained and that marks be prorated "up or down as may be necessary to reach the 82.5 per cent average."

Performance and Ability Different

It seems that these expectations are due to a confusion between "*performance*" and "*ability*." We all know that abilities in an unselected group when properly measured do tend to be spread fairly widely about an average, and produce a normal curve when charted. But failure to obtain a result in measures of performance does not necessarily indicate faulty rating or measurement.

It is not proposed to make here a sweeping denunciation of traditional theory and practice in this matter. Probably in most instances a distribution that is more or less normal correctly represents the facts. There are undoubtedly many situations, however, in which ratings based on *performance* (not *ability*) may properly be grouped closely about a single point on the scale.

All employees in a given unit might be accurately rated as "excellent," for example, on the basis of work performed. These situations are particularly apt to occur in governmental service.

A typical sheet of instructions to rating officers in the Federal Civil Service states: "Base your judgments on the employee's *observed work*, not on his supposed capacities or anticipated performance." And again: "Compare the qualifications and performance of each employee, *as demonstrated by his work*, with the actual needs of the position.

Work Simple and Easy

There are many situations in which the work is relatively simple and easy, considering the abilities of those performing it, and the volume is moderate. Higher recruiting standards are eliminating those for whom work might be at all difficult. Each employee may do well and that is often all that is required of him. On the basis of performance, therefore, there is no ground for spreading the ratings.

If the work were more complex and greater in volume, individual differences in performance would no doubt appear at once, reflecting underlying differences in ability to perform the work. But the fact remains that extreme division of labor has greatly simplified the tasks of large numbers of workers, and often the load is so distributed that no one is required to extend himself unduly to keep up. This is particularly true in governmental work, which is largely of a routine nature, and where piecework or speed-up methods are little known. Moreover, there are many situations in which a speed-up system would not be feasible, even if desired. Consider the lighthouse keeper!

An interesting illustration of the fact that simple tasks may fail to reveal individual differences in ability

may be taken from the field of animal psychology. Over a period of years many psychologists performed experiments in which hungry white rats were required to find their way through various types of mazes in order to get food. Although some rats appeared to learn the mazes more quickly than others, their performance was not consistent, and the weight of evidence indicated that there were no significant differences among rats in the ability to run mazes.

Bright and Stupid Rats

Robert C. Tryon, experimenter at the University of California, however, advanced the hypothesis that white rats do differ greatly in the ability to run mazes quickly and with a minimum of errors, but that mazes used by previous experimenters were too simple to reveal these individual differences. Dr. Tryon proceeded to construct long, complex mazes and in a series of brilliant experiments conclusively proved that rats do differ greatly in their ability to run mazes. Previous mazes had been so easy that even the most "stupid" rats (with respect to this ability) had been able to make creditable showings, while the "brighter" rats had not been given an opportunity to demonstrate their superiority. The long, difficult mazes of Tryon gave this opportunity.

Extreme simplification of tasks, coupled with moderate volume and selective recruiting methods, may result in situations analogous to that faced by rats in a simple maze. The work may not be difficult enough to cause an appreciable spread in performance. Those of least ability may maintain their standard of performance through close application. The supervisor may be impressed by their diligence and give such employees better ratings than he gives those of greater ability who perform equally well with less effort. This may, upon occasion, result in ratings that are inversely correlated with the abilities of those rated, and that are slightly, if at all, correlated with actual performance on the job. The moral of this is that in pursuing a policy of promotion from within, service ratings should be used with discretion.

Specific types of positions in which service ratings may properly be grouped closely about a single point on the rating scale are: all sorts of simple clerical positions, where speed is not an important factor; positions where the primary responsibility is the tending of automatic machines.

The points to look into when a supervisor submits ratings that are closely grouped about a high average are these: Are the duties relatively simple? Is speed relatively unimportant? Is the volume of work moderate? Are recruiting standards high, considering the requirements of the positions? If these questions are answered in the affirmative, a skewed distribution of ratings may be a proper distribution. In such situations, refined ratings based on performance should not be attempted.

If the Eye could only be Educated to Sit Down when it Cannot Adjust to Bad Conditions it Would be Much Better Off.

Good Working Conditions *for* Eyes

By C. E. Ferree and G. Rand
Research Laboratory of Physiological Optics
Baltimore, Md.

To understand the effects of bad lighting on the eye, one of the most fundamental principles to keep in mind is that the eye is always under a reflex incentive to clear up vision. This incentive is strong, so strong that it is extremely difficult to oppose it successfully by an act of will, or voluntarily to force the eye to make an adjustment detrimental to clear seeing. The eye has grown up under daylight. Under this condition three adjustments have developed, (a) the reaction of the pupil to regulate the amount of light entering the eye and to aid the lens in focusing the light from objects at different distances, (b) accommodation and (c) convergence to bring the object on the principal axis of the lens and the image on the fovea. These conditions are necessary for the formation of the clearest images by the lens and for the best discrimination of these images by the retina.

These adjustments take place under a sort of triple bond imposed by their common nerve supply. This bond is so strong that if one adjustment takes place the others also take place, unless the power of separating them has been acquired, and even then their separation is accomplished only by great effort and strain. Artificial lighting with its unusual and unfavorable conditions for clear seeing has come late in the history of the race, and the eye has not developed any reactions or adjustments to meet the conditions imposed.

Yet the incentive to clear up seeing remains and leads to adjustments which, if allowed to take place, serve only further to blur rather than to

clear up vision. For example, a change in accommodation, which is a change designed to clear up an image blurred by changing the distance of the object, is in no sense helpful, only harmful for clearing up an image blurred by bad conditions of lighting; yet so long as unclear seeing is present, due either to a blurring of the image or to unfavorable conditions for its clear discrimination by the retina, the eye will strive by the three adjustments at its command to remedy the deficiency.

Eye Strain

This striving to clear up its vision by ineffectual maladjustments is the cause of what is commonly called eye strain, and an important cause of ocular discomfort. The misdirected effort or strain is of no service to vision and leads rapidly to fatigue and exhaustion, to deformities slight in their physical magnitude but great in their functional importance, to inflammations and congestions and to hypertensions and other conditions not found in a healthy eye. Accommodative strain in itself, for example, leads to congestion of the network of blood vessels just in front of and behind the ciliary muscles. The congestion in this danger zone of the eye leads in turn to an increased flow of fluid into the anterior chamber from the blood vessels on the anterior border of the ciliary muscles and into the vitreous chamber from those on the posterior border of these muscles, perhaps also through the products of the congestion or inflammation to a blocking up of the drainage angle between the iris and the base of the cornea. This tends to produce a disturbance in the normal balance of income and outgo of fluids into the interior of the eye and the evils attending such a disturbance.

Eye strain leads to an unhealthy condition of the eye, exaggerating and aggravating any abnormal tendencies or predispositions already present, lowering its normal recuperative and restorative powers and leading sympathetically to functional disturbances in other parts of the body. Like any other organ of the body, if the eye is to remain healthy or to cure itself of any of its ills, congenital or acquired, it must be put into a situation calling for the healthy exercise of its normal functions.

If the eye could only be educated to lie down under the bad conditions of seeing for which it has no specific corrective adjustment, the cause of vision would be just as well or even better served, and the eye itself would be a great deal better off.

Examination of the Eye

A complete program for light prescribing should have the following features: Tests should be made of the subject's (a) preferred intensity of light, (b) his range of toleration for intensity for comfortable use of his eyes for the work he is most accustomed to do and for different types of work, (c) his susceptibility to glare and (d) his need for color correction. From the results of the

above tests recommendations should be made as to the intensity of light he should use and as to the type of lighting equipment that will best satisfy his needs in this respect, also in respect to protection against glare and harmful coloration of light.

All the above tests can be made very easily and conveniently with an instrument we have called a variable illuminator. (See Arch. Ophthal. 1934, p. 45.) The purpose of this instrument is to provide a means of varying the intensity of illumination in continuous change over a wide range, e.g., 0 to 100 ft-c, without change in the color or composition of the light or in the size, shape or position of the illuminated area. It also provides a means of correcting artificial light to daylight quality.

This instrument may be obtained at a very reasonable price from any of the leading optical companies or through the Better Vision Institute.

Testing for Intensity

In testing the curtains should be drawn and the artificial light turned off. Because of the wide spread of light from the test instrument (140 degrees) general illumination is not needed. The instrument provides a very favorable test condition in relation to the illumination of the surroundings for as the light on the reading page is increased there is a corresponding increase in the amount of light in the surrounding field. This avoids any tendency towards a spotlight effect as the intensity on the test surface is increased and gives a type of illumination similar to that which would be obtained in a lighting system in which the increase of intensity is produced without an increase in glare from the source.

Three sizes of type on test sheets of unglazed paper are provided, (1) the size ordinarily used in printing books (10-point), (2) the size used for magazines and newspapers (8-point) and (3) the customary fine print used for footnotes, etc. (6-point). The examiner may use anything else about which information is wanted.

The subject should be seated directly in front of the test material at a distance of about 18 inches, or in case of a presbyope at the distance needed for his reading glasses. His eyes should be exposed for 3 minutes to the intensity of illumination on the test surface selected as standard for this purpose. Five ft-c is suggested because it is fairly representative of the amount of light now being used by the people who will be tested. The purpose of the test is to find out whether this is sufficient or how much more should be had. Moreover, we have found very little difference in result when the initial exposure was to 5, 10 and 20 ft-c, when the test was properly given, that is, when the series of intensities presented for the subject's judgment is changed sufficiently slowly to allow the size of pupil and changing sensitivity of the retina to keep pace with the changing amount of light. Except in cases where the eyes have previously been exposed for some time to very high or very low intensities of light, we have found 3 min-

utes of exposure to be long enough to bring the eyes to a practically constant state of sensitivity to the illumination selected as preexposure. In this connection it should be remembered that adaptation to light is very rapid, much more rapid than adaptation to dark. That is, the eye when exposed to light loses sensitivity much faster than it recovers in the dark after an exposure to light.

Comfort Point

The full range of intensity of the instrument should first be run to give the person being tested the experience of the different intensities. Then, beginning below 5 ft-c, the intensity should be increased very slowly in order to give the size of pupil and changing sensitivity of the retina a chance to keep pace with the changing amount of light. The subject should be instructed to report when enough light is had for comfort in reading the test material. This intensity should be recorded and the increase continued very slowly, the subject being asked to report when the intensity is too great for comfort or is beginning to be glaring. The difference between these two points is roughly the favorable range or range of toleration for intensity.

The subject is next instructed to turn the knob on the intensity control and find for himself just what intensity he most prefers. He should be allowed all the time he wants to make this determination. Two results are thus obtained, (a) the favorable range or range of toleration, and (b) the intensity most preferred. Both of these should be recorded on the prescription or the recommendation made.

The tests for determining the amount of light needed for reading should be made for the three sizes of print in order from largest to smallest, and then be repeated for the largest size in order to minimize the effect of practice. If there is a difference in result the second value should be used.

The favorable range, it has been found, is wider for daylight and for artificial light corrected for color than for uncorrected Mazda light. It is of course wider for eyes insensitive to glare.

Testing for Susceptibility to Glare

Tests for susceptibility to glare should have a place in a program for the general examination of the eye. Like the physical examination in general medicine such a program sustains a broad relationship the details of which need not be gone into here. Glare is of two types, simple glare and veiling glare. Simple glare is a too high brightness in any part of the field of view due to an excessive stimulation of the sensorium by light. Veiling glare is an obscuring of the image on the retina produced either by an overlay of scattered light or by light reflected from the working surface which is not focused. Susceptibility to simple glare depends primarily on the condition of the sensorium; susceptibility to veiling glare, primarily on the condition of

the media of the eye. For example, in certain stages of the development of cataract the scatter of light is so great that in spite of the growing opacity of the lens, the patient may see much better at low illumination than at high. Also after an operation for cataract the condition in which the capsule of the lens is left often causes so much scatter of light as to give a high susceptibility to veiling glare.

Simple Glare

In the test for simple glare with our variable illuminator, the light may be thrown on a mat white surface of good reflecting power such as Hering standard white paper, and of suitable size such as a reading page. This surface is viewed at the reading distance when the test is being made for susceptibility to glare in reading. Another method of testing is to have the subject look at a sheet of diffusing glass positioned 5 or 6 inches in front of the opening of the illuminator. In the latter case the conditions of the test are the same, with the exception that the glare is produced by transmitted light.

The test may be conducted in a dark room or, if that is not available, in a room from which all light is excluded as nearly as possible except that coming from the test instrument. In order to standardize the sensitivity of the eye it should be exposed for 3 minutes to the test field illuminated to some suitable low brightness which should be kept constant from test to test. The light in the test field should then be varied very gradually from low towards high until the threshold of glare or uncomfortable brightness is reached, due precaution being taken with respect to factors that might influence the constancy of this result. Since size of pupil is an important factor in susceptibility to glare, an artificial pupil should be used in cases where it is desired that this factor should be ruled out. The artificial pupil may be worn in a trial frame; or our device for varying the size of the pupil described in an earlier paper may be used. This latter device is admirable for the purpose. (See Amer. Jour. Ophth., 1932, p. 632.)

In making the test for veiling glare a detail of suitable size, shape and difference from the background may be impressed at the center of the diffusing plate of the variable illuminator. The conditions with reference to amount of light in the room and pre-sensitization or pre-exposure of the eye may be the same as those described in the test for simple glare. Again the light is varied from low towards high until the detail at the center of the field is completely obscured. Then the intensity should be varied below and above this point until the determination is made with certainty of the highest intensity at which the detail is still visible and the lowest intensity at which it disappears. The average of these two points should give a fairly correct and representative value of the threshold of veiling glare.

Composite Test

In the foregoing test, it will be noted, the visibility of the detail to be discriminated is held constant and the intensity of the obscuring or glare-producing light is changed until the threshold of discrimination is obtained. It is obvious that the converse of this principle could also be used, namely, the intensity of the obscuring or glare-producing light could be held constant and the visibility of the detail to be discriminated could be varied until the threshold of visibility was obtained. If the latter principle were used, our variable illuminator or some device provided with a shutter means of changing the intensity could be employed with convenience and advantage to vary the visibility of the detail to be discriminated.

The practical test, considered in relation to light-prescribing, is a composite one which takes into account both simple and veiling glare. We refer to the determination of the upper limit of intensity for comfortable reading, described above under the heading "Testing for Intensity." This test has the further advantage that it is made in the routine procedure of testing for the preferred intensity of light. It will be understood of course that in nonpathologic cases simple glare is the major factor in this determination.

Tests for glare may also be made with our instrument for testing the light sense (See Amer. Jour. Ophth., 1931, p. 275). The method of making the test and the instrument will not be described here.

Results.—With the composite test noted above, we have studied (in collaboration with E. F. Lewis) 550 nonpathologic cases ranging in age from 10 to 77 years. A very brief summary of the results obtained may be given here to show the wide range of variability that may be expected in susceptibility to glare in nonpathologic eyes as measured by the upper limit of intensity for comfortable reading a page of ordinary type (8-point), and the important need there is for testing for this susceptibility in relation to the care of the eye.

Upper limits of light intensity for comfortable reading were found as follows:

Foot-candles of light	Percentage of subjects
0–5	1.7
5–10	11.3
10–15	26.5
15–20	20.8
20–30	17.7
30–40	8.0
above 40	14.0

Thus it will be seen that for 13 percent the upper limit of intensity for comfortable reading was less than 10 ft-c; for 14 percent, above 40 ft-c; for 73 percent, between 10 and 40 ft-c; and for 65 percent, between 10 and 30 ft-c. From these data it might be considered that those who have an upper limit of less than 10 ft-c are more than usually sensitive to glare, and of less than 5 ft-c, extremely sensitive; while those who have an

upper limit of more than 30 or 40 ft-c are less than normally sensitive.

Testing for the Need of Color Correction

The purpose of such tests is a determination of a condition which might be called chromophobia or chromoasthenopia,—that is, an unusual susceptibility to discomfort due to color in light. In case of all eyes there is, so far as we know, a preference for light of daylight color. Reasons for this are the greater comfort and efficiency it gives, a lesser tendency to produce both simple and veiling glare, and the higher visibility that is obtained for objects and backgrounds neutral as to color, e.g., black on white. There seems, however, to be no pressing reason for using the test unless the history of a case shows an undue amount of physiological aversion to artificial light, although many are more than willing to bear the expense of color correction for the sake of the additional comfort and benefit it gives.

The particular need for it is acute in those cases where there is a complaint of distress in working under artificial light. In such cases a color test should be used in conjunction with tests for preferred intensity of light and susceptibility to glare in the endeavor to isolate the cause of the trouble.

For one who really needs light prescribing for color, little more is required in the way of a test than to give him a chance to read or work under color-corrected light. For him the benefit is so great that there is no doubt as to his preference. However, if a more exacting test is wanted, the test for the preferred intensity and range of intensity for comfortable reading or working can be made both for corrected and uncorrected light. Thus the range of intensities used affords the observer ample chance to judge which gives the better results. Or the comparison can be made at equal intensities, for example the preferred intensity for the uncorrected light, or at some other representative intensity. The test should be made with all light as nearly as possible excluded from the room except that coming from the test instrument.

Space might perhaps be allowed here for two examples of benefits obtained by color correction. One is that of a distinguished worker, scholar and teacher around 70 years of age, the acknowledged leader in his field. This man was entirely unable to work at night under ordinary conditions of lighting. So far as was known, there was in his case no pathologic condition of the eyes and no unusual refractive defect. When he had been tested, and the artificial light properly corrected for color, he was according to his own statement able to work if he chose until two or three o'clock in the morning. His own version of the result was that color-corrected light had saved his nights for him.

The other case is that of a well-known editor and journalist around 60 years of age. This man had lost the sight of one eye due to disease and the other was in bad condition. He

had been forbidden to work or read at all under artificial light. His testimony likewise was that color-corrected light saved for him the possibility of working at night. So pleased was he with the result that he had color-corrected light installed all through his house and was, the last time we talked with him, contemplating having it installed in his printing plant, stating that what had given him so great a benefit would, he thought, be good for his employees.

As a final comment on the merits of color-corrected light we may mention some results we have recently obtained with an instrument we devised in 1932. We have called this instrument a Visibility Comparator. Measurements made with it showed in general that given visibilities in Mazda light could be equalled by the use of a much lower intensity of artificial daylight, the amount of this difference varying for a given observer with such factors as the level of intensity used, size of print or other detail, etc.

In the current practice of lighting, the tendency has been to try to increase visibility by increasing intensity of light alone. In this a very serious difficulty is encountered in the glare and ocular discomfort that are apt to be caused by the use of these higher intensities. In case of many eyes this difficulty is very serious indeed and often in those cases where increase of visibility is most needed. In this connection the great effectiveness of color-corrected light for increasing visibility should not be overlooked. In fact the best conditions for clear and comfortable seeing must include an optimum combination of intensity of light, color of light and size of detail. We particularly feel the need of stressing the importance of the factor, correctness of color. From the standpoint of the welfare of the eye there is everything to be said for this factor and nothing against it.

Conclusion

Equally important with the formation of the image on the retina is its clear and comfortable discrimination. The provisions for this are the work of the science and art of lighting. In this work group and individual variations and needs must not be overlooked. These needs and variations can be determined only by some plan or program of testing. There is no one better fitted by interest, occupation, opportunity and training to develop this aspect of lighting than the personnel worker. We know one personnel worker who has held this opinion to his own advantage and very much to the advantage of his employers.

A Man may be Considered an Over Excitable Loud-mouthed "Buttinsky" in One Group of Workers, While in Another He may be Considered a "Good Talker" and Credited with "Plenty of Pep".

Temperament Tests *as* Personnel Aids

By Guy W. Wadsworth, Jr.
Los Angeles

Predictive efficiency in measuring temperament or personality offers many advantages. We note differences in behavior on the job on the part of individuals who appear to be matched in terms of intellect and skill. An apparently able applicant turns out to have a "sour disposition" on the job. Another performs his mechanical duties to perfection, but cannot meet the public. When we deal with these variables even with partial effectiveness, we save expense to the firm, as well as embarrassment to ourselves.

We come to this conclusion from our own recent experiences in using these measures in three ways. (1) We have dealt with over two hundred individual cases of maladjusted employees, and basing recommendations largely upon temperamental findings, have been successful in aiding 60% (after a period of one year) to "meet their problems." 20% more were credited with "some improvement."

(2) Our use of personality test results in passing upon transfers, and in fitting new employees into groups of older workers has served to reduce the number of instances in which technically well qualified employees fail to "get along."

(3) Dealing with new applicants, test scores alone have identified a number of borderline psychopaths, and a few frankly psychotic individuals.

Is Wider Use Desirable?

Can present psychoneurotic inventories and temperament tests be more

widely used in personnel work to deal with this problem? Are the data they offer conclusive, or merely clues for a more extensive type of investigation? If test findings must be supplemented, what additional information is needed, and how can the personnel man secure it?

In the first place, of course, no one should undertake use of the tests themselves without training in psychology, accompanied by clinical experience. If the personnel man lacks this background, he should secure it, or collaborate with a qualified clinical psychologist. Beyond this point the basic requirements can hardly be stated with finality, but our own experience indicates that the following are at least important:

1. Tests must be selected for trial. This requires basic knowledge of the techniques of test development, and of statistics. Aside from taking into account the size of the group upon which the test was standardized, the qualifications of those who identified the criteria (presence or absence in the original subjects of the traits under measurement) to perform that task should be considered.

2. The test results must be interpreted. This requires familiarity with the implications of technical terminology. There is considerable confusion on this score. The term "neurotic" has been applied to anything from a case of jitters to an advanced psychotic state. The name of a test may imply that it covers a broad classification of behavior, where, in reality, it may measure only a few characteristics within the classification. Knowledge of terms must be sufficient to distinguish a partial measurement from a comprehensive one.

3. Relating normal behavior to that observed in abnormality (without proceeding on the thesis that "everyone is a bit crazy") is another requirement. Abnormal people enable us to study the normal population, because they present examples of thoroughly normal traits which have been "carried too far." They also furnish an indication of characteristics which frequently operate in combination. Thus in studying a given subject, we can not only seek to confirm or disaffirm possession of a given trait, but also inform ourselves with respect to "associated" traits.

Relation to Social Group

4. The temperamental pattern, once identified, should be considered in terms of the subject's environment and associates on the job. No "type" of temperament, or trait of personality, (unless manifested in psychopathic degree) may be regarded as uniformly "good" or "poor." Much depends upon the acceptability of the worker's temperament to those about him. The same man may be considered a "buttinsky," loud-mouthed, and overly excitable in one group, while in another he may be regarded as possessed of "a lively (desirable) interest in everything," be considered a "good conversationalist" and credited with "plenty of pep."

5. The methods of the clinician in accumulating evidence should be adopted, and as a corollary, traits described in lay language should be

related to technical symptomatology. Thus a report that the subject is "conceited," "can't be told anything," "feels abused," "thinks people talk about him" furnishes a series of important symptoms which would tend to confirm a finding of introversion in one of the temperamental tests now in use. Other examples would be "worries all the time," "does too much or too little," "does not plan," describing certain phases of emotionality.

The foregoing requirements assume importance due to problems which are peculiar to the task of diagnosing temperament. No one familiar with the subject through actual use of personality tests and psychoneurotic inventories is apt to consider these devices as accurate as tests which measure a subject's ability to perform a required task.

Results Not Quantitative

Tests of intelligence and of aptitude, for example, offer quantitative comparisons of ability to grasp relationships within a time limit, or differentiate the degrees of skill with which given operations are performed. Temperament tests are not similarly quantitative. In the first place, the subject presumably is revealing what he "is like" in certain particulars, rather than what he can do. In the second place, there are no standards of likes, dislikes, emotional trends, introvert tendencies, etc., which can as yet be expressed in "highs" and "lows" for uniform interpretation.

The clinical psychologist and the psychiatrist have probably dealt with temperamental problems more extensively than have others. Dealing primarily with conditions of imbalance, they question the subject at length to identify or rule out symptoms which the subject himself can reveal. Knowing that the subject may lack insight, or fail to deal frankly, they also supplement this inquiry by questioning his parents and acquaintances. In addition, they personally observe his behavior, and interpret it from the viewpoint of clinical experience.

Most of the symptomatology covered in temperamental tests has been borrowed from clinical psychology and psychiatry. However, the development of a test merely means use of a uniform approach in the part of the inquiry which involves direct questioning of the subject. Instead of dealing with him orally, he tells us what he can in written material. This may assure more uniformity in the clinical investigation, where the temptation may otherwise be to follow up the "most promising" symptoms in order to shorten the task of diagnosis. On the other hand, a test in no sense takes the place of extensive history taking from others than the subject. In short, when we borrow one phase of the clinician's approach, we should also borrow his code of discounts on the subject's responses, and similarly extend our inquiry.

Current Cynicism

Failure to do this, with resultant inaccuracies, no doubt accounts for

much of the current cynicism with regard to temperamental measurement. Anyone familiar with testing under actual conditions knows that psychological tests are suspect in industry, and that a single "miss" in ten predictions somehow or other "counts more" than do nine "hits." It is obvious that when the personnel man gets into trouble due to over-dependence upon a type of investigation which is, at best, partial, he has asked for it. There is no warrant for pretending that we know all about a subject's temperament because he scores in the "upper quintile of neurotic subjects," or shows "marked emotionality."

Accepting the thesis that scores in personality tests are merely clues for further investigation, how can the personnel man go about securing the additional data he needs? His sources of information vary, depending upon whether he is dealing with applicants for employment or employees already on the payroll.

Checking New Applicants

Unfortunately the avenues of investigation which are open to the clinician are not similarly open to the personnel man. Once it is known that the inquiry has to do with possible employment, former employers, teachers, relatives and friends tend to qualify their observations in such a way as not to "injure the applicant's chances." Letters of reference and even personal interviews may not be any more productive in connection with temperamental study, than they are in checking technical abilities, reasons for layoffs, and so on.

An alternative lies in utilizing the services of outside investigators. In our own case we use a nationally known credit service, where the investigator, in addition to making a routine credit inquiry, uniformly questions former employers and references of the applicant on points of temperamental significance. This is done without relating the inquiry to prospective employment.

Where such information cannot be secured, the personnel man has two choices. He can give the applicant the benefit of any doubt raised by a pronouncedly questionable showing in the personality test, or he can relate that showing to his findings in cases where similar test scores have proven significant. In our own case, while we try to exhaust the possibilities of investigation, there are extremes in personality test scores which have been too often associated with "problem employees" for us to ignore them in dealing with applicants.

Checking Employees on the Payroll

Periodic reports (ratings) required annually, and permitting the supervisors to describe the employees in their own words, furnish considerable information of temperamental significance. In addition more pointed inquiry can be made in cases where promotions, transfers and discharges are being considered. In short, there is no limitation upon

Supervisors' Descriptions of "Paranoid" Traits

Objectionable	Questionable	Acceptable
	Arrogance	
Cannot "get along" with people, considers them "unworthy," quick to denounce, show contempt, or hamper others by indirection. Takes up a few people whole-heartedly until they cross him, then "wipes them off his list," tries to "undo" them.	Poor team worker due to inability to give others credit for good ideas. Takes offense if his ideas are modified in the least, tactless, sardonic, tends to "hate" others.	Seeks leadership, accepts patronage from no one, proud of his work, more pleasure in self satisfaction than from approval of others.
	Conceit	
Sure that no one is quite as well endowed as he is; fixes on an idea which is "good" principally because he believes in it, defends it because it is his idea, cannot compromise.	Contempt for opinions of others, as they do not proceed from the right source (i.e. his own mind), rejects ideas which are not of his own origination.	Self confident, persistent, does good work due to craving for self-expression, great driving power, willingness to work.
	Personalizing Opposition	
Personal interpretation placed on opposition, sure that his ideas are attacked because they are his, cannot conceive of anything being wrong with the ideas themselves.	Deals in personal invectives, progress consists of overcoming those who stand in his way.	Takes reverses to heart, feels he failed to do his idea justice, tries harder.
	Argumentativeness	
Has fixed ideas of what is "right," defends "right" contentiously, frequently argues for its own sake, becomes attached to subjects about which he can argue, argues "at drop of a hat," does it in name of "principle."	Hard to convince or change when opinions are once formed, first slant on a new idea remains fixed.	Works with conviction, once "sold" he stays put, defends, crusades, "feels right," "cause is just," a strong partisan.
	Suspicion	
Questions other people's motives, thinks "something is behind" anything that happens contrary to his liking, looks for treachery on part of others; thinks they are currying favor when they agree with him.	Wonders at some act of justice on the part of another person; employer is humane only because it is "good business."	Not easily "taken in" by ruses of others, shrewd.
	Feelings of Abuse	
Easily "hurt," takes a rule that affects everybody as specially restrictive to himself, sees no justice in "equal treatment" if it affects him, envious, quick to attack the "greed" of others, expects a "kick in the pants."	Tends to "crab" by force of habit, spreads poor morale, "has his say" on new rules, "under-dog attitude," takes pleasure in being "spokesman," "champion," a "sorehead."	Hews to the letter of rules, careful not to offend, will "take orders" to avoid discipline.

investigation of the existing force. The remarks volunteered by supervisors need only to be interpreted, or they can be directly questioned on any specific point.

Aid of Supervisors

The following study of "paranoid" traits shows how clues to temperament are available in the every day language of supervisors. This was compiled from a review of several thousand ratings. The items are in the supervisor's own words, or represent the sense conveyed in longer statements. (See p. 345.)

In the first column we have the traits as reported when they are considered objectionable; in the second column, the traits as reported when considered questionable. In the third column, we have the same traits manifested within acceptable limits. These gradations are, of course, arbitrary, and are included only to illustrate that temperamental traits may be described in various "degrees." Possession by a given subject of any one of the listed traits may not be significant. But if a man has all or most of the traits to an objectionable or questionable degree, the indication of a paranoid trend is apt to be highly significant.

While far from being perfected devices, our current temperament tests nonetheless do take considerable of the guesswork out of dealing with "personality problems" in the office and factory. They should not be carelessly used. Those who place a gentle trust in scores alone, for instance, without careful follow-up can easily go very wide of the mark. But used carefully and mainly as clues for investigation, temperamental tests are probably one of our best aids in smoothing human relationships on the job. There is every reason to believe that they have now developed to a stage where they may safely be widely used in industry for this purpose.

Book Reviews

LEADERSHIP IN A FREE SOCIETY

By T. N. Whitehead. Cambridge, Mass.: Harvard University Press, 1936, $3.00

Review by Charles S. Slocombe

(By Courtesy of the Editor, Saturday Review of Literature)

A commonly accepted interpretation of the development of the American continent is that restless pioneers moved west and, settling down in groups, formed frontier communities. But the more restless ones could not adjust to the complexities and problems of even small community organization and they, complaining that life had become humdrum, became restless and moved further west into the open country. We have often wondered what has happened to these restless persons since the country has become settled clear to the Pacific coast, and have thought that perhaps a wave of people who cannot stand a humdrum existence has bounced back from the Pacific coast to affect the life of the nation.

Professor Whitehead would perhaps concur with this idea. His central thesis is that there is a dangerous lack of social integration, and that the reactions of workers against the humdrum, uninteresting and arid nature of their lives is increasing this condition.

How Social Groups Form

In the first part of his book is a fascinating description of the ways in which a group of girls, when left free to do as they pleased, so long as they did a satisfactory amount of work, filled their lives with happiness even while doing humdrum jobs.

One girl unconsciously assumed an unofficial leadership and through the informal conversations and relaxations of rest periods integrated them into a social group. Even the output of the girls became correlated with each other and especially with that of the leader.

Then the management made a change in the working conditions. Immediately there was unhappiness and the whole unconscious and informal social structure was smashed. It started to build up again, with accompanying happiness of the girls, when another change was made. Again crack went the satisfying social grouping that had developed. And so it went on, up and down, up and down in work and happiness as repeated changes were made. (We should say that most of these changes were deliberate, as the whole set up was an experiment.)

Whitehead points out, of course, that the girls were totally unaware and unconscious of their own rela-

tions to the other girls, or to the fact that these relations automatically affected their output. These girls were studied over a five year period.

Means of Social Integration

From the results of this and another study he develops what he calls means of social integration. For this purpose he applies the principles derived from the study of these small groups to larger industrial units and to society as a whole. He shows how a modern industrial company is built up of a series of groups or hierarchies of groups like these. He discusses the tremendous resentment which workers feel when their informal associations of this type are smashed by the unthinking, but perfectly logical, actions of management in introducing changes.

On the other hand, he sees an industrial executive under modern fast changing conditions, as being a man whose job it is to introduce changes, which result in breaking up the associations within which workers attempt to develop a sense of social satisfaction, to take the boredom out of their work. The solution to this apparently impossible problem, Professor Whitehead says, lies in industrial executives understanding and recognizing the informal social structures which their employees instinctively set up and guard jealously. He then suggests that the executives should assume active leadership of these groups, so that in a sense changes would come from within the groups (a leader being within a group) and appear as visible needs arising out of the group's own activities.

Professor Whitehead's approach is rather theoretical, and at times difficult to understand. One is constantly in doubt as to whether he has arrived at some new and important conclusions, or whether he is just dressing up old ideas in newer and longer phrases. When he explains himself by means of practical illustrations, which he often does, the importance of his work is more evident.

Provocative Theory

From the viewpoint of the reader, who is looking for a much needed scientific interpretation of industrial democracy, to see where it is headed, the book though distinctly stimulating, is not convincing. It is all very well to make an intensive study of five girls, and from that evolve a theory as to how Myron C. Taylor can lead two hundred thousand steel workers. The theory may be provocative of thought, as Professor Whitehead's is, but it does not satisfy. It rather shows the necessity for an extensive study of large scale industrial leadership. For these reasons the book is not likely to have much influence on the thinking of industrial executives, who should be leaders, and to whom it really should be addressed.

Students of sociology and progressive thinkers will find much in it to ponder over and discuss.

ADMINISTRATIVE LABOR LEGISLATION

By John B. Andrews. New York: Harper & Brothers, 1936, pp. 231. $2.50

Reviewed by HERMAN FELDMAN

This "study of American experience in the delegation of legislative power" admirably fills a long-felt want for a comprehensive yet readable and compact presentation of a subject which is of supreme importance under American conditions of government. Information about it hitherto has been available for the non-specialized student in technical treatises or in scattered and sketchy form. The author, who is secretary of the American Association for Labor Legislation, is himself equipped by a lifetime of study and experience for such a book and he has also had assistance and coöperation from associates and officers in the front rank as legal authorities in this field. The result is a distinctive contribution for which gratitude is due and will for a long time be owing from those in government and in academic activities who have occasion to study or teach the subject.

Although the volume deals with labor legislation, the wider field into which it fits is in the study of those types of commissions and authorities which exercise, within the framework of American constitutional provisions, a combination of executive, legislative and even judicial powers. Such agencies make rules which in practice amount, in large part, to independent exercise of law-making function; they enforce their own rulings in executive fashion; they hear complaints and decide on the validity of protest, very much like a court of justice; yet under proper provision and handling, they are wholly within the keeping of constitutional principles and are our salvation in the development of effective means of administration of vital public interests. Their experience within various jurisdictions during recent decades is of great importance. Their particular significance in this country arises in the fact that they provide a possibility of modernization and concentration of governmental procedures to overcome serious defects which an artificial separation of powers through rigid constitutional barriers seemed to have fastened upon Governmental activity.

In view of the rapidity with which the States and the Federal Government are taking on new functions and obligations, the failure of citizens to comprehend the true scope and manner of exercising such authority, its values, limitations, and its dangers, will prove an obstacle to effective administration. Everyone who reads this excellent exposition, made the more interesting by a lucid style and exceptionally good typography and format, will feel himself fortunate for having obtained an understanding of this basic development in American government.

THE ANATOMY OF PERSONALITY

By Howard W. Haggard and Clements C. Fry. New York: Harper & Bros., 1936, 357 pp. Illustrated edition $3.00. Text edition $2.00

The purposes of the authors in presenting this nontechnical analysis of personality are for the reader to "obtain from it the insight into his own personality that gives the understanding of self which is the first step toward self-improvement; and also the insight into the peculiarities of others which is the first step toward the broad tolerance that gives respect for fellow men."

The authors have chosen to explain personality by a structural analysis dividing personality into physique, i.e. tall, thin men or short stocky men; impulse, i.e. shy, shrinking men or aggressive, virile men; intelligence; temperament, i.e. quickness, moodiness; and the ego, i.e. a man's attitude toward himself and others. Under these five headings the authors discuss personality and build it up as a contractor builds a house of bricks. With the current emphasis on functional analysis rather than structural analysis, this point of view is somewhat disappointing. No less disappointing is the emphasis on "types."

The behavior of people falling into each classification are described systematically and the reader will find a great deal of interest and will doubtless be able to catalog many of his friends under the various types. Although the illustrations used are of abnormal persons, it is concerned mainly with reasonably normal persons.

The difficulty comes in generalizing from these cases. This difficulty occurs in any "type psychology." Kretchmer's types are carefully listed, for instance, although hopeful psychologists fascinated by the simplicity and objectivity of such an approach to the analysis of personality have experimented with them and have not yet obtained test results that were encouraging.

The exceptions to the rule have proven so numerous that the rule comes to mean little. The thin, tall physique may be idealistic and melancholy in many cases or it may have come to typify such behavior. If you were drawing a caricature of a melancholy idealist you would not be apt to draw a stout, short, ruddy man. Yet how many tall thin men are jolly and realistic. There is therefore very definite limits to the use of such indications for judging people.

Unlike many books on this subject The Anatomy of Personality is interesting and easily understood and, although, it does not give a deep insight into the problem of personality or report all the present views on the subject, it emphasizes a greater tolerance and realization of the limits and possibilities of men and women.